COMMONWEALTH INST.
ENTOMOLOGY LIBRARY
13 MAR 1951
SERIAL U.S.A. 109
REPRINT

The Florida Entomologist

Official Organ of the Florida Entomological Society

DECEMBER, 1950

Vol. XXXIII No. 4

CONTENTS

Page

WOLFENBARGER, D. O.—On the Distribution of *Heilipus squamosos* (Lec.), a Pest of the Avocado 139

JOHANNSEN, O. A.—A New *Pterobosca* from Florida with a Key to American Species 141

HERRING, JON L.—The Aquatic and Semiaquatic Hemiptera of Northern Florida. Part 2: Veliidae and Mesoveliidae 145

HUSSEY, ROLAND F.—*Leptocorixa filiformis* in the United States. (Hemiptera: Coreidae) 150

HUSSEY, ROLAND F., and HERRING, JON L.—Rediscovery of a Belostomatid Named by Thomas Say. (Hemiptera) 154

NOTICES 157

Published quarterly by the FLORIDA ENTOMOLOGICAL SOCIETY
Box 2425, University Station, University of Florida, Gainesville

Mailing Date: February 6, 1951

The
FLORIDA ENTOMOLOGIST

VOL. XXXIII DECEMBER, 1950 NO. 4

THE FLORIDA ENTOMOLOGICAL SOCIETY

OFFICERS FOR 1949-1950

President.....J. A. MULRENNAN
Vice President.....W. G. BRUCE
Secretary.....MILLEDGE MURPHEY
Treasurer.....L. C. KUITERT
Executive Committee.....C. F. LADEBURG, J. P. TOFFALETTI

EDITORIAL BOARD

LEWIS BERNER.....*Editor*
H. K. WALLACE.....*Associate Editor*
L. C. KUITERT.....*Business Manager*

Issued once every three months. Free to all members of the Society. Subscription price to non-members $2.00 per year in advance; 50 cents per copy.

Manuscripts and other editorial matter should be sent to the Editor, Dr. Lewis Berner, Biology Department, University of Florida, Gainesville. Subscriptions and orders for back numbers are handled by the Business Manager, Dr. L. C. Kuitert, Box 2425, University Station, University of Florida, Gainesville. The Secretary can be reached at the same address.

One zinc etching, not to exceed one-half page in size, or the equivalent thereof, will be allowed free. The actual cost of all additional illustrations must be borne by contributors. Reprints of articles may be secured by authors if they are ordered before, or at the time proofs are received for correction; 25 copies furnished free to authors.

REPRINTS WITHOUT COVERS

Pages	1	2	3...4	5...8	9...12	13...16	17...20	21...24	25...28	29...32
50 copies	1.60	2.00	2.70	4.25	6.70	7.25	9.40	10.40	12.05	12.80
100 copies	1.95	2.40	3.20	5.10	7.80	8.60	11.00	12.95	15.10	16.20
Add 100 copies	.75	.75	1.10	1.60	2.70	3.10	3.70	4.80	5.85	6.20

In most instances whole numbers can be furnished more cheaply than reprints.

Additional for Covers, with Titles and Author's Name

25 copies .....$3.50 100 copies $5.00

ON THE DISTRIBUTION OF *HEILIPUS SQUAMOSOS* (Lec.) A PEST OF THE AVOCADO

D. O. WOLFENBARGER
University of Florida Sub-tropical Experiment Station

The curculionid *Heilipus squamosus* (Lec.), recently recognized by Wolfenbarger (1948, 1949) as a pest of the avocado, was described over 125 years ago. Through correspondence with the Division of Insect Identification of the U. S. Bureau of Entomology and Plant Quarantine, Dr. W. H. Anderson credits J. E. LeConte (1824) with giving a description of the species under the genus *Pissodes*. In a later publication Blatchley and Leng (1916) cited *H. squamosus* as synonymous with *H. apiatus* Olivier. This synonymity is accepted as an error since Dr. Anderson reported that, "Olivier's species is quite different and occurs in South America." The further statement by Blatchley and Leng (loc. cit., p. 187) that *H. squamosus*, "Occurs also in French Guiana." is, therefore, not accepted by me.

The distribution of *Heilipus squamosus* (Lec.) seems to be generally summarized in a further quotation from Dr. Anderson that, "Judging from adults in the pinned collection the species occurs in South Carolina, Georgia, Florida, Alabama, Mississippi, and Tennessee." In general, this is the southeastern part of the United States.

Plants from which the adult *Heilipus squamosus* has been collected include, according to Dr. Anderson, sassafras, cotton, camphor, and Satsuma. These are regarded as comparatively unrelated species. Most of the specimens were collected from sassafras, a member of the laurel family. *Heilipus squamosus* larvae have been taken only from the avocado, according to Dr. Anderson, and comprise those sent from the Sub-Tropical Experiment Station. The avocado, incidentally, is also a member of the laurel family, Lauraceae.

Heilipus squamosus has existed in Florida for many years and is considered indigenous to the area of its distribution. The introduction of the avocado into Florida, on the other hand, apparently occurred about 150 years ago, according to Wolfe, et al (1949). The avocado, a subtropical or cold susceptible plant, is restricted to the warmer areas. Sassafras, on the other hand, is either absent or grows sparsely where the avocado grows. The host plants of the larvae, other than the avocado, are unknown, although there must be one or more.

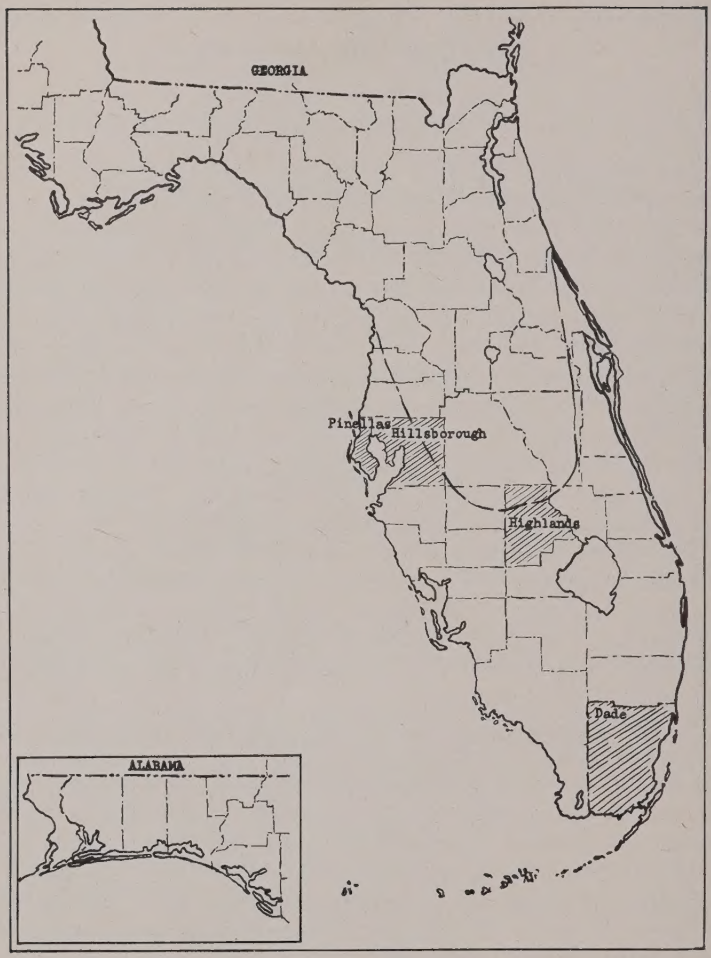


Figure 1. *Heilipus squamosus* collections from avocado trees. Counties where beetles were taken are shaded. Elliptical line roughly approximates northern boundary of more important avocado plantings.

Sometime after the introduction of avocado *Heilipus squamosus* found it to be a satisfactory larval host plant. Within the last two decades the abundance of the beetle has increased. This increase seems to have been following a logarithmic curve. There are those, however, who indicate that wind, water, dryness, or other factors so weakened the trees that the beetle was

able to develop in them. Extensive avocado plantings have undoubtedly resulted in the elimination of some host plants. With or without some adaptation, a transition was made to the avocado.

Although *Heilipus squamosus* has hitherto lacked economic importance its recent impact on commercial avocado production makes it of importance to southern Florida, where avocado production is successful. The areas of known distribution of *Heilipus squamosus* are illustrated roughly in Figure 1. Some meager examinations were made in other counties, Brevard for example, without finding the species. It is likely that more complete surveys will disclose State-wide distribution of the beetle.

LITERATURE CITED

Blatchley, W. S., and C. W. Leng. 1916. Rhynchophora or weevils of Northeastern America. Nature Pub. Co., Indianapolis.

LeConte, Captain John. 1824. Description of some new species of North American Insects. Ann. Lyceum of Nat. Hist., N. Y. 1:169-173.

Wolfe, H. S., L. R. Toy, and A. L. Stahl, Rev. G. D. Ruehle. 1949. Avocado Production in Florida. Fla. Ext. Bull. 141: 1-124.

Wolfenbarger, D. O. 1948. Heilipus squamosus Lec., a new enemy of the avocado. Proc. Fla. State Hort. Soc. for 1948: 260-264, illus.

———— also in Calif. Avoc. Soc. Yrbk. for 1948: 98-102, illus.

A NEW PTEROBOSCA FROM FLORIDA WITH A KEY TO AMERICAN SPECIES

O. A. JOHANNSEN
Cornell University

A few specimens of undescribed Ceratopogonidae (Heleidae), ectoparasites on dragonflies, have been given to me by Dr. J. G. Needham for study. One of these is from Florida, the first record of a member of the genus *Pterobosca* from the United States, facts that may be of interest to the readers of this Journal. All recorded species of the genus, more than a dozen in number, are parasites on dragonflies, attaching themselves in most cases to the wings. Tokunaga (1940) records one species *(P. feminae)* from Japan that attaches itself to the thorax. The Florida species described below, was likewise found on the thorax where it was firmly fixed. *Pterobosca* together with *Lasiohelea, Euforcipomyia,* and *Apelma,* are regarded by some

entomologists as subgenera of *Forcipomyia*, all having in common large empodia nearly as long as the claws; the wing with microtrichia and macrotrichia, the latter long, more or less depressed, abundant, and covering the greater part of the wing surface; the costa extending to about, or a little beyond, the middle of the wing; and the anterior radial cells small, sometimes with one or both obliterated by the coalescence of the adjacent veins. The chief differential characters of *Pterobosca* are the six or seven long, terminal, antennal segments, the short intermediate segments 3 to 8 (or 9); and the very large and broad empodium fitted for clinging to the wings or the body of dragonflies. The claws are either unusually large or entirely lacking. The males are not known.

There are among the *Lasiohelea* some species that are ectoparasitic on insects, a few upon dragonflies. The line separating the two genera *Pterobosca* and *Lasiohelea* is not sharply marked, since each group has a few species that possess some character which is usually found only in the other, rendering it impossible to formulate concise definitions for these two genera.

AMERICAN SPECIES OF THE GENUS *Pterobosca*

Females

1. Feet without claws; third palpal segment with distinct sense pit; a single spermatheca; fourth tarsal segment nearly as long as the fifth. Honduras ..... *P. incubans* Macfie
– Feet with strong, cleft claws ..... (2)
2. Length of antennal segments 10 to 15 combined more than three times as great as 3 to 9 combined; wing 1.15 mm. long by 0.5 mm. wide; wing surface bare alongside the veins. Florida ..... *P. floridana* n. sp.
– The antennal ratio less than 2.6 ..... (3)
3. Brazilian species. Wing bare alongside the veins; antennal ratio nearly 2.6 ..... *P. macfiei* Costa-Lima
– European species. Wing surface not distinctly bare alongside the veins. Antennal ratio 2.4 ..... *P. paludis* Macfie

The last mentioned species is included for comparison. Keys to species of the eastern hemisphere are to be found in the papers of Macfie (1936b), Oka (1948), and Tokunaga (1940).

Pterobosca floridana n. sp.

Female. Blackish species, including the halteres; legs dark brown. Eyes contiguous, bare; third palpal segment swollen, with large, very dinstinct, centrally placed, sense pit; fifth segment tapering, about a fourth longer than the one preceding. Antennae with the last six segments elongate, the ratio of the length of these segments combined to the length of segments 3 to 9 combined, is 3.1; the latter disc-like, i.e. transverse; segments 1 and 2 globose, the first membranous above; terminal segment including papilla, a third longer than the preceding one. Mandibles each with ten teeth aside from the terminal tooth. Length of wings 1.15 mm., width 0.5 mm.; microtrichia moderately coarse; macrotrichia on the veins and on the disc except alongside the veins and the bases of cells R, M, and Cu., which are nearly or quite bare. The two anterior radial cells subequal in length, the first very narrow, slit-like; the second about as wide as the diameter of the section of the costa in front of it; the first radial vein ends about opposite the level of the fork of the cubitus. Tibia of the middle leg is about 2.4 times as long as the basitarsus, the latter is 2.4 times as long as the second segment; fourth tarsal segment about 0.6 as long as the fifth exclusive of the claws. Claws moderately slender, much curved, swollen at and beyond the bend, deeply cleft; empodium large, reaching nearly to the tip of the claws. Apical part of the abdomen broken off so no spermatheca was seen.

This species resembles the European *P. paludis* Macfie as well as the Brazilian *P. macfiei* Costa-Lima but differs in antennal ratio as well as other characters as indicated in the key given above.

The specimen was found attached to the thorax of a dragonfly *(Pachydiplax longipennis)* by Dr. J. G. Needham at Archbold's, near Lake Placid, Florida, April 23, 1947. Type in the Cornell University Collection.

In the University collection are three specimens which were found on the wings of three species of dragonflies taken by Dr. Needham at L. Tortuguero, Puerto Rico, February 10, 1935. Owing to their defective condition it is inadvisable to name them. They all resemble *P. floridana* in coloring but differ in being smaller, with a wing length of 0.9 mm. Of the specimen taken on the wing of *Cannacria herbida,* nothing now remains but one wing and a hind leg. The wing resembles that of *P.*

floridana, the leg differs in having the claws, although cleft, more slender apically. The other two specimens, one from the wing of *Erythrodiplax* sp., the other from *Lepthenis vesiculosus,* differ from *P. floridana* in having eyes with sparse, short pile; in the tarsal ratios, and in a smaller antennal ratio. These two specimens lack claws, which to judge by the broken appearance of the empodia, seem to have been torn off when the specimens were forceably removed from the wing of the dragonfly. Some species of *Pterobosca* wholly lack claws, but the condition of the feet here seem to show that claws had been present. If these two specimens really are members of the genus *Pterobosca* as the wing venation and the structure of the antennae indicate, they are the first of the genus to be recorded as having pilose eyes, a character found in some species of the allied genus *Lasiohelea.*

REFERENCES

Costa-Lima, A da. Instit. Oswaldo Cruz, Memorias. 32(2):616. 1937.

Johannsen, O. A. Ann. Ent. Soc. Amer. 36:763-791. 1943.

Macfie, J. W. S. Tijdschr. v. Ent. 75:269-283. 1932.

————. Proc. R. Ent. Soc. London. 5:63. 1936a.

————. l. c. 5:227, 228. 1936b.

————. l. c. 6:111. 1937.

Oka, H. Mushi. 18:107-113. 1948.

Tokunaga, K. Tenthredo. 3:110. 1940.

————. Philippine Journ. Sci. 71:310. 1940.

THE AQUATIC AND SEMIAQUATIC HEMIPTERA OF NORTHERN FLORIDA

PART 2: VELIIDAE AND MESOVELIIDAE

JON L. HERRING
Department of Biology, University of Florida

FAMILY VELIIDAE

Genus MICROVELIA Westwood

Microvelia borealis Bueno

This species is distinguished from all the others by its size (1.6 - 2.00 mm.) and the curved hind tibia in the male. In addition the females are orbicular in shape.

M. borealis is the most abundant form in North Florida. It has been taken from sinkholes, Nymphaea marshes, calcareous streams, sand-bottomed creeks, roadside ditches and fluctuating hammock region ponds.

I have adults of this form that were collected in February, March, April, August, September, October, and December. Nymphs were taken in March, August, September and October.

SPECIMENS EXAMINED: *Alachua Co.:* Sinkhole, 3 miles southeast of Gainesville on the Pearl Street Road, September 27, 1937, H. T. Townsend 2♂♂, 3 nymphs; December 18, 1934, H. T. Townsend 1♀; October 7, 1934, H. T. Townsend 5♂♂, 13♀♀, 1n; February 3, 1935, H. T. Townsend 1♂, 1♀; Biven's Arm of Payne's Prairie, March 2, 1946, W. Beck 1♀; Hogtown Creek near the sink, March 27, 1947, 75♂♂, 75♀♀; Santa Fe River at Poe Springs, May 8, 1947, 5♂♂, 8♀♀; Woods Pond, west end of Payne's Prairie, March 27, 1943, J. S. Rogers, 4♂♂, 8♀♀, 3n; Willow Pond, location and collector unknown, April 9, 1934, 1♀. *Bradford Co.:* Lake Hampton, February 6, 1949, 2♂♂, 2♀♀. *Dixie Co.:* Small pond underneath Suwannee River Bridge, September 9, 1947, 2♀♀. *Marion Co.:* Rainbow River, August 4, 1946, 3♂♂, 2♀♀.

Microvelia hinei Drake

This is the smallest of our North Florida forms. Its length is 1.3 - 1.6 mm. The sexes are similar in shape and the hind tibiae of the male are straight.

The habitat of this species is very much the same as for *borealis*. It has not been collected from calcareous streams but has been taken from mats of sphagnum moss in the quite-acid swamp and bog streams.

I have adults that were collected in February, March and September. I have seen no nymphs.

SPECIMENS EXAMINED: *Alachua Co.:* Pond "C", 3 miles southwest of Gainesville, March 5, 1934, H. T. Townsend, 1♂, 1♀; Blues Creek Swamp,

6 miles northwest of Gainesville, September 11, 1947, 1♂, 2♀♀; Biven's Arm of Payne's Prairie, March 6, 1947, 1♂, 1♀; sinkhole pond on west end of Payne's Prairie, March 20, 1947, 1♂, 2♀♀. *Bradford Co.:* Lake Hampton, February 6, 1949, 6♀♀.

Microvelia albonotata Champion

M. albonotata differs from all others in this area by its bright yellow and brown coloration, the row of spines on the posterior femora of the male and the distinct pallid tubercle on the male venter. Its length is 2.2 - 2.4 mm.

It has been taken only from a sand-bottomed lake in Alachua County. No field notes are available for this collection.

SPECIMENS EXAMINED: *Alachua Co.:* Lake Santa Fe, December 4, 1947, 1♂; December 2-16, 1948, E. D. McRae, Jr., 2♂♂, 2♀♀, 1n.

Microvelia buenoi Drake

I collected a single male of this species from a mat of sphagnum moss along the shore of a swamp and bog stream. This is a new record for Florida.

SPECIMEN EXAMINED: *Alachua Co.:* Blues Creek Swamp, 6 miles northwest of Gainesville, September 11, 1947, 1♂.

Microvelia alachuana Hussey and Herring

This form, described recently, is the largest of the North Florida Microvelias. Its size is 2.5 - 3.2 mm. At present it is known only from the type locality, Little Hatchet Creek, in Alachua County.

The life history is unknown. One nymph was collected in March.

Genus RHAGOVELIA Mayr

Rhagovelia choreutes Hussey

This species has been taken only from swiftly flowing sand-bottomed creeks and calcareous streams. Specimens were collected easily in great numbers along the shore, in the shade of overhanging trees, or beneath bridges, since they tend to congregate in compact schools. This form does not frighten easily and on many occasions, I have remained at one spot and collected an entire colony. They usually scatter upon the first approach of the collector but will return to the same area time after time. Normally, they avoid open water, but they are quite at home there as well as in the swifter pools where they zig-zag over the surface in circular fashion.

Gould (1931) states that Rhagovelias "are excellent divers and can swim readily below the surface of the water"; however,

this seems very unlikely. I have never observed water striders swimming beneath the film, although they are capable of regaining the surface if pushed beneath it. This is accomplished with difficulty.

Adults and nymphs have been collected in almost every month of the year.

SPECIMENS EXAMINED: *Alachua Co.:* Hogtown Creek, west branch below Michigan Avenue Bridge, February 19, 1934, J. S. Rogers et al 46♂♂, 15♀♀; Hogtown Creek, east branch, February 15, 1937, Collector unknown, 11♂♂, 6♀♀; Hogtown Creek, 200 yards south of Michigan Avenue, April 24, 1937, F. N. Young, 5♂♂, 6♀♀; February 3, 1948, 7♂♂, 15♀♀, 1n; Santa Fe River at Poe Springs, March 14, 1933, collector unknown, 5♂♂, 3♀♀; May 14, 1934, H. T. Townsend, 4♂♂, 11♀♀; March 24, 1937, collector unknown, 2♂♂; April 17, 1943, J. S. Rogers, 75♂♂, 75♀♀, 150n; May 8, 1947, 15♂♂, 25♀♀, 50n; Little Hatchet Creek at Alachua Airbase, May 13, 1947, G. K. Reid and H. G. Dowling, 4♂♂, 5♀♀, 9n; May 15, 1947, 53♂♂, 55♀♀, 200n; sand-bottomed creek, 2 miles south of Devil's Millhopper, November 8, 1937, S. H. Spurr, 3♂♂, 3♀♀, 4n. *Hernando Co.:* Salt Creek, 2 miles east of Bayport, November 1, 1947, 19♂♂, 7♀♀, 2n; January 29, 1948, 60♂♂, 38♀♀, 50n; March 20, 1948, 18♂♂, 18♀♀, 36n; April 25, 1948, 122♂♂, 105♀♀, 51n; May 22, 1948, 30♂♂, 16♀♀, 6n; June 19, 1948, 3♂♂, 2♀♀, 1n; June 20, 1948, 33♂♂, 23♀♀, 10n. *Marion Co.:* Silver Springs, April 3, 1948, collector unknown, 2♂♂, 3♀♀; October 11, 1948, W. McLane, 1♀. *Putnam Co.:* Little Orange Creek, January 18, 1948, 2♂♂, 1♀, 2n.

Genus VELIA Latreille

Velia watsoni Drake

This species prefers the emergent vegetation of the shore line. They run out upon the surface film only when disturbed. At Salt Creek, specimens of *watsoni* were taken from a raft of leaf debris that had accumulated in a small cove along the shore. The small rafts were lodged in clumps of *Mariscus* sp. in shallow water. In a swamp and bog stream, this species was taken from a partly submerged log covered with sphagnum.

Drake (1919) states that the eggs are deposited on floating aquatic plants and floating sticks or wood just beneath the surface of the water.

SPECIMENS EXAMINED: *Alachua Co.:* Blues Creek, 6 miles northwest of Gainesville, April 10, 1947, 1♀. *Hernando Co.:* Salt Creek, 2 miles east of Bayport, January 29, 1948, 2♂♂.

Velia brachialis Stal

I have taken *V. brachialis* from almost all North Florida habitats in small numbers. It is most often collected from beneath cover of shore vegetation, in crevices of logs or upon

rocks or stumps along the edge of the water. They are usually taken in small groups. In one instance, however, thirty-eight specimens were collected from the underside of an old oak limb protruding from the water on Payne's Prairie. They were arranged in rows side by side in the crevices of the bark just above the water line. In only a few cases were any specimens collected from the open surface film. Many specimens were forced from their place of hiding by dousing the shore zone with water.

I have adults that were collected in every month of the year except September, and nymphs that were collected in April, May and July.

SPECIMENS EXAMINED: *Alachua Co.:* Biven's Arm of Payne's Prairie, April 8, 1946, W. Beck, 1♂; July 5, 1946, W. Beck, 2♂♂, 4♀♀, 4n; July 10, 1946, W. Beck, 2♀♀; October 22, 1946, W. Beck, 2♀♀; November 12, 1948, B. Cooper, 1♀; Hogtown Sink, March 1, 1947, D. Miller, 1♂; March 27, 1947, 1♀; River Styx, 6 miles southeast of Gainesville, January 31, 1948, 1♂, 1♀; April 13, 1947, 2♂♂, 3♀♀; sinkhole pond, 3 miles southeast of Gainesville on Pearl Street Road, May 25, 1934, H. T. Townsend, 3n; December 9, 1934, H. T. Townsend, 1♂, 1♀; December 18, 1934, H. T. Townsend, 1♀; April 15, 1935, H. T. Townsend, 1♂, 1♀; Haile's Siding Pond on Payne's Prairie, November 23, 1947, 1♂; Payne's Prairie, April 5, 1947, 28♂♂, 10♀♀; Pond "C", 3 miles southwest of Gainesville, May 18, 1933, J. Kilby, 1♂, 6n; Santa Fe River at Poe Springs, May 8, 1947, 1♂; Lake Lochloosa, February 1, 1937, collector unknown, 1♂. *Hernando Co.:* Salt Creek, 2 miles east of Bayport, January 29, 1948, 1♀; May 22, 1948, 2♂♂; June 19, 1948, 1♂, 1♀; June 20, 1948, 1♂, 1♀; Weekiwachee River, ½ mile west of spring, November 2, 1947, 1♂. *Levy Co.:* Pond in hammock, near Williston, March 22, 1947, J. Grant and K. Strawn, 1♀; August 25, 1945, collector unknown 1♀. *Marion Co.:* Lake Bryant, April 16, 1938, S. H. Spurr, 1♂, 1n; Rainbow River, August 4, 1946, 1♂.

FAMILY MESOVELIIDAE

Genus MESOVELIA Mulsant and Rey

Mesovelia mulsanti White

Jaczewski (1930, p. 7) considers *mulsanti* to be a variable species distributed "over a vast area extending at least from Southern Canada, in the North, to the Central Provinces of the Argentine Republic in the South." On the basis of the shape of the male gonapophyses, he designates four subspecies of this form. These differences do not appear to me to be sufficient to separate this variable species into races. He has designated the North American form *M. m. bisignata.*

This species is abundant upon the weed-grown ponds, ditches, Nymphaea marshes and small coves of calcareous streams and

sand-bottomed creeks. This form is found almost everywhere that there are small secluded areas overgrown with vegetation. It appears to be most at home on algal mats and rafts of duckweed.

Hungerford (1917) and Hoffman (1932) have published complete studies of *M. mulsanti.* As with the other forms, it appears that no hibernation occurs anywhere in Florida, and mating and oviposition occur almost throughout the year. Adults have been collected in every month of the year except June, and nymphs have been collected in January, March, April, May, September, November and December.

SPECIMENS EXAMINED: *Alachua Co.:* Sinkhole pond, 3 miles southeast of Gainesville on the Pearl Street Road, May 25, 1934, H. T. Townsend, 2♂♂, 3♀♀; November 10, 1934, H. T. Townsend, 3♂♂, 7♀♀, 1n; December 8, 1934, H. T. Townsend, 28♂♂, 24♀♀, 4n; January 3, 1935, H. T. Townsend 1♂, 2♀♀; January 9, 1935, H. T. Townsend, 11♂, 7♀♀, 1n; March 9, 1935, H. T. Townsend, 3♀♀, 7n; April 15, 1935, H. T. Townsend, 1♂, 2♀♀; Hogtown Sink, March 13, 1947, 13♂♂, 5♀♀; May 1, 1947, 14♂♂, 25♀♀, 3n; Hogtown Creek near the sink, March 27, 1947, 19♂♂, 12♀♀, 2n; Hogtown Creek, west branch 200 yards south of Michigan Avenue, February 3, 1948, 1♂; Biven's Arm of Payne's Prairie, April 5, 1937, collector unknown, 1♂; February 12, 1946, W. Beck, 1♀; April 27, 1946, W. Beck, 1♀; November 13, 1947, 1♀; Lake Wauberg, December 3, 1932, J. S. Rogers, 1♂, 1n; April 30, 1938, collector unknown, 3♀♀, 1n; Santa Fe River at Poe Springs, May 14, 1934, H. T. Townsend, 1♀, 5n; March 12, 1938, collector unknown, 3♂♂, 2♀♀; Santa Fe River, 200 yards east of Poe Springs, May 8, 1947, 2♂♂; Santa Fe River at Worthington Springs, February 6, 1949, 2♂♂, 1♀; Lake Alice, March 17, 1937, S. W. Gaylord, 1♀; November 12, 1937, S. H. Spurr, 1♂; May 24, 1938, S. H. Spurr, 3♂♂, 1♀; Pond "C", 3 miles southwest of Gainesville, April 4, 1933, J. S. Rogers, 1♂; May 18, 1933, J. Kilby, 3♀♀, 1n; cypress-gum swamp, 5 miles southeast of Gainesville, January 31, 1948, 1♂; Payne's Prairie, September 16, 1947, 3♂♂, 1♀; Haile's Siding Pond on Payne's Prairie, November 23, 1947, 1♂, 1♀; sinkhole in Palm Terrace, Gainesville, January 5, 1938, O. E. Frye, 2♀♀; sinkhole pond west end of Payne's Prairie, March 20, 1947, 1♀; pond, 500 yards north of River Styx, April 13, 1947, 1♂, 2♀♀; pond in San Felasco Hammock, October 5, 1948, 2♀♀; Twin Oaks Pond, August 8, 1946, H. G. and P. Dowling, 1♂. *Dixie Co.:* Small pond underneath Suwannee River bridge, September 9, 1947, 1♂, 1♀. *Hernando Co.:* Salt Creek, 2 miles east of Bayport, January 29, 1948, 1♀. *Levy Co.:* borrow pit, 6 miles east of Cedar Key, December 31, 1947, 4♂♂, 4♀♀. *Marion Co.:* Rainbow River, August 4, 1946, 1♀; Silver Springs, May 7, 1934, R. R. Sheppard, 1♀.

Mesovelia amoena Uhler

This species has been taken from floating mats of duckweed *(Riccia fluitans)* on the surface of sinkhole ponds and from the algal mats of a Nymphaea marsh.

SPECIMENS EXAMINED: *Alachua Co.:* Pond "C", 3 miles southwest of Gainesville, May 18, 1933, J. Kilby, 1 ♀; Payne's Prairie, September 16, 1947, 1 ♀; Hogtown Sink, March 13, 1947, 1 ♀; sinkhole pond on west end of Payne's Prairie, March 20, 1947, 7 ♀ ♀.

LITERATURE CITED

Drake, C. J. 1919. A new species of *Velia* from Florida. Fla. Buggist 3: 1-2.

Gould, G. E. 1931. The *Rhagovelia* of the Western Hemisphere, with notes on world distribution (Hemiptera, Veliidae). Kans. Univ. Sci. Bul. 20: 5-61.

Hoffman, C. H. 1932. The biology of three North American species of *Mesovelia* (Hemiptera-Mesoveliidae). Can. Ent. 64: 113-120, 126-134.

Hungerford, H. B. 1917. The life history of *Mesovelia mulsanti* White. Psyche 24 (3): 73-83.

Jaczewski, Tadeusz. 1930. Notes on the American species of the genus *Mesovelia* Muls. Ann. Musei Zoologici Polonici. 9 (1): 1-11.

LEPTOCORIXA FILIFORMIS IN THE UNITED STATES (HEMIPTERA: COREIDAE)[1]

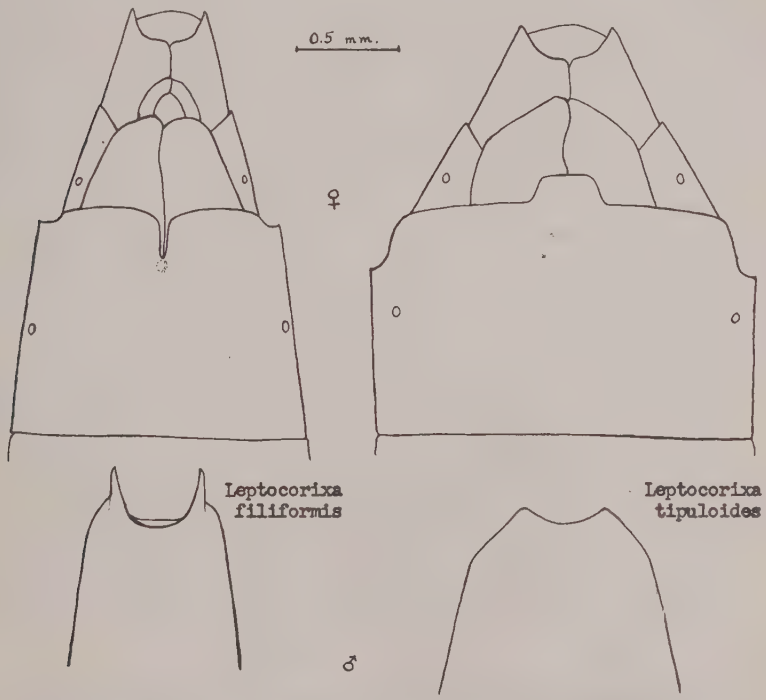
ROLAND F. HUSSEY, Lakeland, Florida

The long slender greenish bugs of the genus *Leptocorixa* are very commonly encountered in Florida when sweeping grasses, ferns and shrubbery, especially in thinly wooded areas; often they come to lights. Until now, *Leptocorixa tipuloides* (DeGeer) has been the only species of this tropicopolitan genus reported from the United States. Its range extends from Florida and Georgia west to Texas, and southward through the Antilles and Central and South America to Bolivia and northern Argentina. It has been recorded from numerous places in Florida by Van Duzee (1909, p. 49), Barber (1914, p. 521), Torre-Bueno (1921, p. 61) and Blatchley (1926, p. 260). However, some of the specimens on which these records are based have proved, upon re-examination, not to be *tipuloides*.

All of the *Leptocorixa* that I have taken in three years' collecting in Polk County are *L. filiformis* (Fabr.), and I have found this species confused with *L. tipuloides* in several collections. During the past summer I was privileged to examine the North American *Leptocorixa* in the Museum of Zoology of the University of Michigan, the U. S. National Museum, and the Entomology and the Biology Departments of the University

[1] Contribution from the Biology Department, Florida Southern College.

of Florida. I wish here to express my thanks to Doctors T. H. Hubbell, R. I. Sailer, A. N. Tissot and H. K. Wallace, respectively, for these privileges.



Above: Last abdominal segment and genital segments of females, ventral aspect. *Below:* Apex of genital segment of males, ventral aspect.

Tabulation of these materials shows that both species of *Leptocorixa* occur extensively in Florida, perhaps throughout the entire state. *L. tipuloides* is represented in these collections from the southern tier of countries in Georgia to the tip of peninsular Florida, but though it has been reported as fairly common in Cuba by Barber and Bruner (1947, p. 86) it seems to occur only sparingly in southern Florida. *L. filiformis* is much the more common of the two species in the southern half of the state, but ranges north at least to Clay and Columbia Counties. The U. S. National Museum has *filiformis* also from Morgan City, Louisiana.

Leptocorixa filiformis was described from "Americae insulis." Like *tipuloides* it ranges far into South America, and I have

numerous specimens before me from Paraguay. Possibly it is extending its range northward at present. It does not occur in collections made by Dr. Hubbell in northern and western Florida between 1923 and 1946, but a half-dozen specimens were taken in Alachua County in the spring of 1950 by students in the Department of Biology of the University of Florida. The Department of Entomology has a specimen, however, from Lake City in Columbia County which Dr. Tissot tells me was collected prior to 1905, and other specimens in this collection were taken at light at Leesburg and at Lake Alfred in 1930.

Neither *tipuloides* nor *filiformis* is of economic importance. In Cuba they both inhabit large grasses, according to Barber and Bruner (1947). Several oriental species of *Leptocorixa,* however, are serious pests on rice. This is predominantly an old-world tropical genus, with only three species recorded from the Americas, and it is more familiarly known as *Leptocorisa* Latreille, 1829. Its name was originally published in the French form *Leptocorise* by Latreille in 1825, and was first validly latinized as *Leptocorixa* by Berthold in 1827. Therefore *Leptocorixa* Berthold has two years' priority over *Leptocorisa* Latreille, as pointed out by Bergroth (1913) and Blöte (1937).

The two species treated here fall in different subgenera as defined by Stål (1873, p. 87) and can easily be separated by the subgeneric characters he gave. Other differences have been pointed out by Stål (1868, p. 66) and Barber (1923, p. 20; 1939, p. 324). These may be summarized as follows:

L. TIPULOIDES.—Male genital segment most obtusely sinuate at the apex, its hind angles obtuse or subrounded next the sinus; sixth ventral segment of female obtusely produced at the middle, not cleft, the dorsal genital segments shorter (subgenus *Stenocoris*); form more robust; second antennal segment distinctly shorter than the third; femora reddish at the tips; basal cell of membrane infuscated.

L. FILIFORMIS.—Male genital segment deeply sinuate, the hind angles acutely prominent; sixth ventral segment of female subtruncate behind and with a short cleft on middle line, dorsal genital segments longer (subgenus *Leptocorixa*); form more slender; second antennal segment subequal to the third; femora not or most obsoletely reddish toward the tips; basal cell of membrane not infuscated though usually enclosed by fuscous veins.

I do not find any significant difference in length, both species commonly measuring 15 to 16 mm. Both Stål and Barber have stated, however, that *filiformis* is smaller as well as more slender than *tipuloides*. I have seen specimens from the following North American localities: all are in Florida unless otherwise stated.

LEPTOCORIXA TIPULOIDES (DEGEER).—Gainesville (Alachua Co.), Miami (Dade Co.) [my coll.]. Gainesville; Orlando (Orange Co.), Brooksville (Hernando Co.), Palm Beach (Palm Beach Co.), Paradise Key[2] (Dade Co.); also Thomasville, Ga., Louisiana, Texas [U. S. N. M.]. Liberty, Leon, Madison, Baker, Bradford, Alachua and Orange Counties; also Valdosta, Ga. [U. Mich. Mus.]. Leon, Alachua, Marion and Manatee Counties [U. Fla. Biol. Dept.].

LEPTOCORIXA FILIFORMIS (FABR.).—Various localities in Polk County [my coll.]. Edgewater (Volusia Co.), Vero Beach (Indian River Co.), Hardee County, Naples (Collier Co.), Venice (Sarasota Co.), Paradise Key (Dade Co.); also Morgan City, Louisiana [U. S. N. M.]. Alachua and Putnam Counties [U. Fla. Biol. Dept.]. Clay, Putnam, Hillsborough, Polk, Highlands, St. Lucie, Broward, Dade, Monroe Counties [U. Mich. Mus.]. Lake City (Columbia Co.), Leesburg (Lake Co.), Lake Alfred (Polk Co.), Bradenton (Manatee Co.) [Dept. Ent., U. Fla. Agr. Exp. Sta.].

LITERATURE CITED

Barber, H. G. 1914. Insects of Florida. II. Hemiptera. Bull. Amer. Mus. Nat. Hist. 33(31): 495-535.

Barber, H. G. 1923. Report on certain families of Hemiptera-Heteroptera collected by the Barbados-Antigua Expedition from the University of Iowa in 1918. Univ. Iowa Stud. Nat. Hist. 10 (3): 17-29.

Barber, H. G. 1939. Insects of Porto Rico and the Virgin Islands.—Hemiptera-Heteroptera (excepting the Miridae and Corixidae). N. Y. Acad. Sci.: Sci. Surv. Pto. Rico Virg. Isl. 14(3): 263-441.

Barber, H. G., and S. C. Bruner. 1947. The Coreidae of Cuba and the Isle of Pines with the description of a new species (Hemiptera-Heteroptera). Mem. Soc. Cubana Hist. Nat. 19(1): 77-88.

[2] Paradise Key is not shown on any recent maps that are at hand. It is not an island, but rather is an inland hammock. Dr. Sailer writes me that H. S. Barber used this place name for material collected in 1919 in what is now Royal Palm Park. Latitude and longitude coordinates, given me by the Board on Geographic Names, place Paradise Key about 17 miles southwest of Homestead, or slightly southwest of Royal Palm Park.

Bergroth, E. 1913. Bibliographisches über Hemipteren. Ent. Mitt. 2(1): 10-12.

Blatchley, W. S. 1926. Heteroptera or True Bugs of eastern North America. 1116 pp. Indianapolis.

Blöte, H. C. 1937. On African species of Leptocorixa Berthold. Temminckia 2: 281-296.

Stål, C. 1868. Hemiptera Fabriciana. 1. Kongl. Svensk. Vet.-Akad. Handl. 7(11): 1-148.

Stål, C. 1873. Enumeratio Hemipterorum. 3. Kongl. Svensk. Vet.-Akad. Handl. 11(2): 1-163.

Torre-Bueno, J. R. de la. 1921. New records of Florida bugs. Bull. Brooklyn Ent. Soc. 16(2): 61. [*L. tipuloides* recorded from St. Petersburg.]

Van Duzee, E. P. 1909. Observations on some Hemiptera taken in Florida in the spring of 1908. Bull. Buffalo So. Nat. Sci. 9(2): 150-230.

REDISCOVERY OF A BELOSTOMATID NAMED BY THOMAS SAY (HEMIPTERA)

ROLAND F. HUSSEY[1] and JON L. HERRING[2]

It seems reasonably certain to the writers that the species we described recently as *Abedus (Microabedus) cantralli* is the same as the form which was named *Belostoma fluminea* var. *immaculata* by Say in 1832. Say's entire account of this "variety" was contained in the following words: "Much smaller [than *B. fluminea*]; lateral margin of the thorax depressed and slightly reflexed; feet immaculate. Length half an inch. Most probably a distinct species, but I have seen but one specimen." Although *B. flumineum* is a common and well-known form throughout the northern states, the variety *immaculata* has remained unknown and has not been reported in the literature from 1832 until now.

Most specimens of *A. cantralli* are between 13 and 14 mm. in length, but a male measuring 12.4 mm. and a female 12.7 mm. long are among our paratypes, both collected near Gainesville by the junior author. The latter specimen agrees exactly with the size given for *immaculata* in Say's description. No other North American belostomatid species has been discovered which is as small as this.[3]

[1] Florida Southern College, Lakeland.
[2] University of Florida, Gainesville.

[3] The smallest specimens we have seen measure 11.5 and 12.5 mm. respectively. Both were taken by the senior author near Lakeland on December 29, 1950.

Our specimens of *cantralli* commonly have quite evident annulations on the front and middle tibiae, those on the middle legs being less distinct than the ones on the front pair. But we have paratypes from the Gainesville area whose middle tibiae are quite unmarked and whose front tibiae have annuli so obsolete that they are nearly invisible. Say's unique specimen may well have been of this variant with the legs unmarked or practically so. The median pale vitta of the dorsum which we described in *cantralli* is not mentioned by Say, but this marking is quite variable and indeed it is entirely absent in about half of the specimens now at hand. It may be remarked that since the description went to press, the senior author and Mr. J. E. Burgess, Jr., have collected nearly forty additional specimens of this species. These were found in a shallow pool, some 18 inches deep and largely grown up with pickerel weed *(Pontederia)*, in a clearing in a small cypress swamp about eleven miles north of Lakeland.

Say's description of the thoracic margins agrees with the condition found in *cantralli*. The pronotal margins of *Belostoma testaceum* (Leidy) are plainly carinate but not at all depressed and then reflexed. This is the only North American belostomatid known which approaches *cantralli* (or *immaculatus)* in size, but we have seen no *testaceum* smaller than 16 mm. among some 60 specimens examined, nor have we seen any *cantralli* exceeding 14.3 mm. in length.

Say gave no locality for his var. *immaculata*. However, it is well known that he himself made collections in southeastern Georgia and in northeastern Florida, principally along the St. Johns River. One of the paratypes of *cantralli* is from Liberty County, in southeastern Georgia; another paratype was taken 4½ miles southeast of Bostwick, in Putnam County, Florida, less than a mile from the St. Johns River. Although there is no evidence that Say's unique specimen came from either of these areas, no species resembling it has been discovered elsewhere.

We believe, therefore, that the synonymy of this species is:

Abedus (Microabedus) immaculatus (Say), new combination.

Belostoma fluminea var. *immaculata* Say, 1832, Descr. new spp. Heter. Hemip., p. 38; reprinted by Fitch, 1857, Trans. N. Y. St. Agr. Soc. 17: 809, and by Leconte, 1859, Compl. Writ. Thomas Say, 1: 365.

Abedus (Microabedus) cantralli Hussey & Herring, 1950, Florida Ent. 33(2): 85. New synonymy.

By coincidence, the name *immaculata* was also used by Leidy in 1847 for a variety of his *Perthostoma aurantiacum* (a synonym of *Belostoma flumineum* Say), differing by being "pale luteous, [with] no maculations." It is to be inferred from Leidy's account that this form was found in Pennsylvania together with the typical *aurantiacum*. Obviously this is not the same as Say's *immaculata*, although Van Duzee treated it as such in his Catalogue (p. 467). This error on Van Duzee's part contributed to the present writers' describing *cantralli* as a new species, as Leidy's paper was at hand when the description was prepared while that of Say was not available at the time. If *immaculata* Leidy is to be considered a valid variety, its preoccupied name must be replaced. We believe, however, that it is best regarded as a simple synonym of *Belostoma flumineum* Say.

With the var. *immaculata* of Say identified at long last, only one of the numerous Hemiptera described by him is still an unknown quantity. This is the *Capsus ocreatus* from Georgia, whose type was presented to Say by Mr. Oemler of Savannah. This species was thought probably a Pyrrhocorid by Stål in 1870, and was tentatively made a synonym of *Dysdercus andreae* (Linn.) by Blatchley in 1926, but its true status is still uncertain.

LITERATURE CITED

Blatchley, W. S. 1926. Heteroptera or true bugs of eastern North America. Indianapolis: The Nature Publ. Co. 1116 pages.

Hussey, R. F., and J. L. Herring. 1950. A remarkable new Belostomatid (Hemiptera) from Florida and Georgia. Florida Ent. 33(2): 85-89, 2 figs.

Leidy, J. 1847. History and anatomy of the Hemipterous genus Belostoma. Jour. Acad. Nat. Sci. Philadelphia, n. s., 1(6): 57-67, Pl. X.

Say, Thomas. 1832. Descriptions of new species of Heteropterous Hemiptera of North America. New Harmony, Indiana, dated Dec. 1831. Reprinted by Fitch, 1857, Trans. N. Y. St. Agr. Soc. 17: 755-812, and by Leconte, 1859, Compl. Writ. Thos. Say on Entom. North Amer. 1: 310-368.

Stål, C. 1870. Enumeratio Hemipterorum, 1. Kongl. Svensk. Vet.-Akad. Handl. 9(1): 1-232. (p. 124).

Van Duzee, E. P. 1917. Catalogue of the Hemiptera . . of America north of Mexico. Univ. Calif. Publs., Ent. 2: 1-902.

FORMATION OF THE ENTOMOLOGICAL SOCIETY OF CANADA

Ottawa, December 1, 1950.—At the eigthy-seventh annual meeting of the Entomological Society of Ontario, held at Guelph on November 1-3, 1950, it was decided to form a national society, to be called the Entomological Society of Canada. The new society will serve as a link between the various regional societies, namely, the Acadian Entomological Society, the Entomological Society of Ontario, the Entomological Society of Manitoba, the Entomological Society of British Columbia, the proposed entomological society of Quebec, and others that may be established. *The Canadian Entomologist* will be published jointly by the Ontario and the national societies, Dr. W. R. Thompson continuing as Editor, with Dr. G. C. Ullyett as Associate Editor.

W. A. Ross, Division of Entomology, Ottawa, was elected President and Professor A. W. Baker, Ontario Agricultural College, Guelph, Vice-President. R. H. Wigmore and A. B. Baird, Division of Entomology, Ottawa, have been named Secretary and Treasurer respectively. The Directors comprise the presidents of the regional societies, namely, D. D. Pond, Fredericton, N. B.; W. N. Keenan, Ottawa, Ont.; C. A. Smith, Winnipeg, Man.; and Prof. G. J. Spencer, Vancouver, B. C.; as well as Father O. Fournier, President, Montreal Branch of the Entomological Society of Ontario; Dr. C. W. Farstad, Dominion Entomological Laboratory, Lethbridge, Alta.; and Dr. A. S. West, Queen's University, Kingston, Ont.

The annual meeting of the national society will always be held jointly with the annual meeting of one of the regional societies. In 1951, the combined meetings will be held at Ottawa.

NOTICE

From time to time it is proposed to publish short notes about the activities of the members of the Florida Entomological Society. Items concerning promotions, travels, honors or awards, publications, etc. are particularly pertinent. Please send all such information to the editor.

ENTOMOLOGICAL ITEMS

Edward Carlton Johnson, of Pompano Beach, Fla., has been appointed field representative of entomology for the Florida Agricultural Supply Company, it was announced yesterday by Mr. M. C. Van Horn, general manager of the company.

Johnson, a graduate of the University of Florida, class of 1950, where he received his B.S. degree in entomology, will operate in the territory stretching from Homestead to Fort Pierce area on the east coast and from Collier City to Sarasota on the west coast.

A native of Live Oak, Fla., Johnson was born and reared on a farm and prior to attending the university, was engaged in agriculture at Pompano Beach. During the war he served in the U. S. Navy and for some time after the war was attached to silver bullion salvage operations in Tokyo Bay.

Johnson is a member of the American Association of Economic Entomology and of Sigma Nu fraternity. His two brothers, John William and Oscar K. Johnson are engaged in farming and produce brokerage at Pompano Beach. A sister, Mrs. Mary V. Blyth, lives in Jacksonville.

The Florida Agricultural Supply Company is a division of the Wilson & Toomer Fertilizer Company, Jacksonville.

Dr. Lewis Berner has recently returned to the University of Florida to resume his teaching duties after an absence of eight months. While away from the University, Dr. Berner was on a special mission to the Gold Coast of British West Africa where he undertook a survey of the insects of medical importance in the Volta River system.

PROVEN ADJUVANTS

For Agricultural Dusts —

CP-5 DUST STICKER

For Agricultural Sprays —

COLLOIDAL Z-1
MULTI-FILM-L

(LIQUID)

•

COLLOIDAL PRODUCTS CORPORATION

2598 Taylor St.

SAN FRANCISCO, 11, CALIFORNIA

Spreaders • Deposit Builders and
Stickers for Agricultural Sprays and Dusts Since 1920

PRINTING

FOR ALL PURPOSES

Carefully Executed ● **Delivered on Time**

PEPPER PRINTING COMPANY

GAINESVILLE - - - - - - - - - - FLORIDA

OUTDOOR LABORATORY

Rohm & Haas Experimental Farm at Bristol, Pa.

Long-time testing on our 300-acre Experimental Farm *proves* the formulations developed by Rohm & Haas Research Laboratories —*under actual farming conditions*. Result: maximum effectiveness in commercial use of such chemicals for agriculture as DITHANE and RHOTHANE.

Because it controls many diseases of many crops without retarding plant growth, DITHANE helps thousands of farmers to increase yields of potatoes and other crops. And because of its unique insecticidal qualities, RHOTHANE gives orchardists effective control of the red-banded leaf roller on apples, and the orange tortrix on pears, apples, grapes and other fruit.

Scientific development and exhaustive testing-in-use will continue to assure the effectiveness of *all* Rohm & Haas agricultural chemicals.

CHEMICALS FOR INDUSTRY

DITHANE and RHOTHANE are trademarks, Reg. U.S. Pat. Off. and in principal foreign countries.

ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

An IDEAL Combination

FERTILIZE with **IDEAL** Fertilizer—dependable for more than 50 years.

PROTECT your crops with **FASCO** and **IDEAL** Brand insecticides and fungicides—ideally suited for control of insect pests, fungus attacks and plant diseases in grove, orchard, garden or field.

CONSULT with the trained field representatives of Wilson & Toomer and Florida Agricultural Supply companies who are always available for sound, experienced advice.

FASCO

Here is a partial list of pesticides obtainable direct from your **FASCO** dealer, **IDEAL** Brand Warehouse or through our field representatives:

COPPER SPRAYS and DUSTS—
- Fasco "Nu-Tri-Cop" Spray
- Fasco Neutral Copper Dust
- Fasco Cuminoil Emulsion (Copper Oil)

ORGANIC INSECTICIDES—
- Sprays, Dusts, and Bases
- Terpene (Toxaphene) Products
- BHC Products
- Chlordane Products
- TEPP Sprays
- DDT Products
- Parathion Products

SULPHURS—
- Dusting Sulphurs
- Wettable Sulphurs

AGRICULTURAL BAITS—

LIME SULPHUR SOLUTION—

IDEAL BRAND OIL EMULSION CONCENTRATE—

"IFN" (Nutritional) SPRAYS and DUSTS—

"DE-KA-GO" TREE WOUND PAINT—

Florida Agricultural Supply Company

Division of

WILSON & TOOMER FERTILIZER COMPANY

General Offices **Jacksonville, Florida**

ISOTOX
VAPOPHOS

lindane and

parathion

quality formulations
are preferred by growers and
research men

CALIFORNIA SPRAY-CHEMICAL CORPORATION
ORLANDO, FLORIDA

INSECT-PINS

First Qualities

From 000 - 8

1000 pieces insect-pins, black steel $0.80
1000 pieces insect-pins, from anti-corrosive steel.... $1.25
1000 pieces minutiae 0,15 black steel $0.30

Payable after receipt of the goods in U.S.A.

WE CAN SUPPLY ANY AMOUNT

•

Apply for offer and cost-free samples to:

INSECT-PINS, Salzburg, Solaristrasse 14, Austria

FOR BETTER CONTROL OF MORE INSECTS

use insecticides containing

Thiophos

REG. U. S. PAT. OFF.

PARATHION

Commercial use of THIOPHOS Insecticides in 1948 and 1949 confirmed the outstanding results obtained experimentally in 1947.

Such insects as aphids, mites, beetles, mealy bugs, thrips, leaf miners, purple scale and Florida red scale are among the more important pests which are easily and economically killed with Wettable Powders and Dilute Dusts containing THIOPHOS Parathion.

THIOPHOS Insecticides are supplied by well-known manufacturers under their own brand names. Select one of these reliable manufacturers as your source of supply and discuss with an accredited representative your insect problem. Do the same with Federal and State agricultural experts in your locality.

AMERICAN Cyanamid COMPANY

AGRICULTURAL CHEMICALS DIVISION
BREWSTER, FLORIDA

DU PONT
REG. U. S. PAT. OFF.

AGRICULTURAL CHEMICALS

COPPER-A COMPOUND
A safer fungicide for copper-sensitive plants.

COTTON DUSTS
BHC, DDT and sulfur combined, or Toxaphene sulfur for all-in-one control of cotton insects.

DEENATE* DDT
Insecticide in five formulations.

FERMATE*
Organic fungicide, ferric dimethyl dithiocarbamate, adapted for use as preventive for diseases on fruits, tobacco, ornamentals and certain vegetables.

KRENITE*
Water-soluble dinitro spray, both insecticide and fungicide.

LEXONE* 10-GW
BHC wettable powder, but usable as dust.

MARLATE* 50 INSECTICIDE
Methoxychlor insecticide for fruits, vegetables and livestock—particularly dairy.

PARZATE* FUNGICIDE
Organic fungicide based on zinc ethylenebisdithiocarbamate for control of principal diseases on potatoes and certain other vegetable crops.

PARZATE* LIQUID
A fungicide based on disodium ethylenebisdithiocarbamate.

SULFORON* X
Micro-fine wettable sulfur fungicide.

ZERLATE*
Organic fungicide based on zinc dimethldithiocarbamate, compatible with most insecticides.

WEED KILLERS

AMMATE*
Ammonium sulfamate, non-selective weed killer for control of hard-to-kill woody weeds and brush.

Du Pont 83% Sodium 2,4-D Weed Killer
Sodium salt of 2,4-D acid for control of many broad-leaf plants, selectively.

Du Pont 2,4-D 65% Amine Weed Killer
Contains 2,4-D as triethanolamine salt, formulated for low gallonage applications.

Du Pont 2,4-D 74% Amine Weed Killer
Contains 2,4-D as triesopropanolamine salt, formulated for low gallonage applications.

Du Pont 2,4-D 46% Ester Weed Killer
An oily, liquid form of 2,4-D containing 46% isoproyl ester.

Du Pont 90% Sodium TCA Weed Killer
A dry powder containing 90% Sodium trichloroacetate.

OTHER DU PONT PEST CONTROL PRODUCTS

Calcium Arsenate
Du Pont Spreader-Sticker
Flotation Sulfur Paste
Grasselli* Lead Arsenate
NuRexform* Lead Arsenate
Lime Sulfur
Loro*
Sulforon*
Zinc Sulfate
Phenothiazine

CONSULT YOUR EXPERIMENT STATION

DU PONT
REG. U. S. PAT. OFF.

Better things for better living . . . through chemistry

E. I. du Pont de Nemours & Co. (Inc.)

Grasselli Chemicals Department

Wilmington 98, Delaware

* Reg. Trade Mark of E. I. du Pont de Nemours & Co., (Inc.)

FOR

1950

BETTER FRUIT PROGRAM

USE

STAUFFER

DUSTS and SPRAYS

SEE YOUR NEAREST DEALER

Stauffer

INDUSTRIAL CHEMICALS

SINCE 1885

Office and Plant

APOPKA, FLA.

PHONE 2331-2341

for *superior* insect control

VELSICOL
"1068"

chlordane

best by test and in actual use:

- ★ ANTS
- ★ CHINCH BUGS
- ★ CUTWORMS
- ★ GRASSHOPPERS
- ★ MOLE CRICKETS
- ★ ROACHES
- ★ SERPENTINE LEAF MINERS
- ★ WIREWORMS

Insect Toxicant Solvents

For DDT, oil and emulsifiable concentrates use Velsicol AR-50, AR-50G, AR-60

VELSICOL CORPORATION

330 EAST GRAND AVENUE, CHICAGO, ILL., *Representatives in Principal Cities*

approved

FOR CONTROL OF THESE PESTS

Alfalfa Weevil • Armyworm • Ash-Gray Blister Beetle Aster Leaf Miner • Black Blister Beetle • Black Cutworm Boll Weevil • Bollworm • Caragana Blister Beetle Carolina Grasshopper • Cattle-Biting Louse • Cattle Tick Chinch Bug • Clear-Winged Grasshopper • Clover Seed Chalcid • Cotton Aphid • Cotton Fleahopper • Cotton Leafworm • Differential Grasshopper • Ear Tick • Fall Armyworm • Garden Webworm • Granulate Cutworm • Gray Blister Beetle • Green Cutworm • Gulf Coast Tick • Hairy Chinch Bug • Hog Louse • Horn Fly • Lesser Migratory Grasshopper Lined Spittlebug • Little Fire Ant • Lone Star Tick • Long-Nosed Cattle Louse • Lygus Meadow Spittlebug • Millipedes • Mormon Cricket • Nuttall Blister Beetle • Packard Grasshopper • Peanut (Potato) Leafhopper • Pear Psylla • Pear Thrips • Pink Bollworm Rapid Plant Bug • Red Goat Louse • Red-Legged Grasshopper • Salt-Marsh Caterpillar Serpentine Leaf Miner • Sheep Tick • Short-Nosed Cattle Louse • Southern Armyworm Southern Green Stink Bug • Spittlebug • Strawberry Crown Borer • Strawberry Leaf Roller • Strawberry Weevil • Striped Blister Beetle • Suckfly • Sugar Beet Webworm Superb Plant Bug • Sweet Clover Weevil • Tarnished Plant Bug • Thrips • Tobacco Budworm • Tobacco Hornworm • Tomato Hornworm • Tomato Pinworm • Two-Striped Grasshopper • Variegated Cutworm • Velvetbean Caterpillar • Western Cotton Plant Bug • White-Lined Sphinx • Winter Tick • Yellow Goat Louse • Yellow-Striped Armyworm

For specific information on toxaphene (chlorinated camphene 67-69% Cl) write to the manufacturer:

HERCULES POWDER COMPANY INCORPORATED *909 King Street, Wilmington, Del.*

toxaphene

NX51-4

In Canada, toxaphene is available through:

HARRISONS & CROSFIELD (CANADA) LTD. • Calgary • Edmonton • Toronto • Winnipeg • Vancouver

SPRAY
or DUST

with Reliable, Dependable

Black Leaf 40 provides *multiple protection* against aphids, most thrips and similar sucking insects. Kills by contact and by fumes — versatile, economical, effective protection against crop losses.

Black Leaf 40 is *discriminating.* Controls aphids and other destructive pests — spares beneficial insects.

Black Leaf 40 is *compatible* with other standard spray and dust materials. Leaves no harmful residue.

Companion Products:

Black Leaf 3% Nicotine Dust
Black Leaf Nicotine-Rotenone-Sulphur Dust
Nico-Fume Pressure-Fumigators
Benzo-Fume Pressure-Fumigators
Nico-Fume Liquid

TOBACCO BY-PRODUCTS & CHEMICAL CORPORATION

RICHMOND, VIRGINIA